

# Notice of Allowability

Application No.

10/669,384

Examiner

Andrew O. Arena

Applicant(s)

BASCERI ET AL.

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the statement of common ownership made 04/19/2007.
2. ☒ The allowed claim(s) is/are 67-114.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## DETAILED ACTION

### *Examiner's Amendment*

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

#### **Claims 96 and 105 are amended as follows.**

96. A method for forming a capacitor comprising:
- providing a substrate assembly comprising a surface material, wherein the surface material comprises oxygen;
  - forming a first electrode on at least a portion of the surface material, wherein forming the first electrode comprises:
    - forming a first metal layer on at least a portion of the surface material,
    - forming a second metal layer on at least a portion of the first metal layer,
    - forming an oxidation diffusion barrier layer on at least a portion of the second metal layer,
    - oxidizing at least a portion of the second metal layer to form one or more metal oxide regions by causing oxygen to diffuse through the first metal layer to oxidize one or more regions of the second metal layer by thermal treatment of the substrate assembly having the first metal layer, second metal layer, and oxidation diffusion barrier layer formed thereon, and
    - removing the oxidation diffusion barrier layer and unoxidized portions of the second metal layer;
  - forming a dielectric material over at least a portion of the first electrode; and
  - forming a second electrode on at least a portion of the dielectric material.

Art Unit: 2811

105. A method for use in formation of a capacitor comprising:

providing a substrate assembly comprising a surface, wherein the surface comprises oxygen;

forming a first electrode on at least a portion of the surface, wherein forming the first electrode comprises:

forming a first metal layer on at least a portion of the surface portion,

forming a second metal layer on at least a portion of the first metal layer,

and

forming one or more metal oxide regions on at least portions of the first metal layer by causing oxygen to diffuse through the first metal layer to oxidize one or more regions of the second metal layer through selective oxidation of the second metal layer;

forming a dielectric material over at least a portion of the first electrode; and

forming a second electrode on at least a portion of the dielectric material.

Authorization for this examiner's amendment was given in a telephone interview with Mark J. Gebhardt on 08 May 2007.

**The title is replaced with the title in quotations as follows:**

"Oxygen diffusion from a substrate through grain boundaries of a first metal layer to oxidize a second metal layer".

***Election/Restrictions***

Claims 67-95 are allowable. Claims 96-114, previously withdrawn from consideration as a result of a restriction requirement, require all the limitations of an allowable claim. Pursuant to the procedures set forth in MPEP § 821.04(a), the **restriction requirement between claims 67-95 and claims 96-114, as set forth in the Office action mailed on 09/20/2005, is hereby withdrawn** and claims 96-114 are hereby rejoined and fully examined for patentability under 37 CFR 1.104.

In view of the withdrawal of the restriction requirement, applicants are advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once the restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

***Allowable Subject Matter***

Claims 67-114 are allowed.

Allowable subject matter has been indicated because the prior art references of record, alone or in combination, do not teach or suggest at least the limitation of causing oxygen to diffuse through the first metal layer to oxidize one or more regions of the second metal layer as required by claims 67-114.

Art Unit: 2811

***Terminal Disclaimer***

The terminal disclaimer filed on 04/30/2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of US 6,534,357 has been reviewed, accepted, and has been recorded.

***Conclusion***

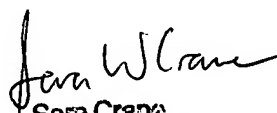
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is 571-272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard T. Elms can be reached on 571- 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Andrew O Arena  
8 May 2007



Sara Crane  
Primary Examiner